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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MATTHIAS, JONATHAN R

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,494	Applicant(s) KANEEDA ET AL.	
	Examiner Jonathan Matthias	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/27/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed on March 23rd, 2009 has been entered. Claims 1-20 are pending in the application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4-6, 10, 11, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,145,303 to Strehlau et al. (Strehlau).
4. In reference to claims 1, 4, and 17, Strehlau discloses a sulfur component trapping agent (5, Fig. 21) for trapping sulfur components, which is arranged before the NOx trapping catalyst (6, Fig. 21) and a catalyst (8, Fig. 21) for oxidizing the sulfur components, disposed before the sulfur component trapping agent that contains at least one alkali or alkaline earth metal (col. 10, lines 9-22) and at least one noble metal, Pt, Pd and Rh in an amount of 0.4 % by weight or less of the sulfur trapping agent (col. 10, line 59 – col. 11, line 16), wherein the sulfur component trapping agent does not substantially release the trapped sulfur components under the conditions of the internal combustion engine (col. 7, lines 24-45).
5. In reference to claim 5, with regards to the limitation that the sulfates contained in the sulfur component trapping agent have a melting temperature or decomposition temperature of 750 °C or higher, Strehlau discloses utilizing aluminum, magnesium,

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calcium, and/or barium as the sulfur trapping agent (col. 10, lines 9-15), which, according to Applicant's disclosure (see Table 1), would meet the limitations of the claim.

6. In reference to claim 6, Strehlau discloses the sulfur component trapping agent is disposed below the engine (see Fig. 21).

7. In reference to claim 10, Strehlau discloses the catalyst for oxidizing sulfur components contains at least one of Pt, Pd and Rh (col. 10, line 59 – col. 11, line 16).

8. In reference to claim 11, Strehlau discloses the NO_x trapping catalyst functions to trap SO_x under a lean air fuel condition and to release SO_x in a rich or stoichiometric air fuel condition by heating the catalyst to 500 °C or higher (col. 8, line 56 – col. 9, line 60).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 2, 3, 9, 13-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strehlau.

12. In reference to claims 2, 3, and 13, Strehlau discloses the apparatus of claim 1, further including the NO_x trapping catalyst functions to trap NO_x in the exhaust gas when an air fuel ratio of the exhaust gas is lean (col. 6, lines 20-34). With regards to the limitations of a test flow rate, trapping rate, and release rate, these are considered result-effective variables which are dependent on factors such as the type of fuel being used, the type and running state of the engine, and emissions regulations to be met. It has been held that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have optimized these variables to have the predictable result adapting the apparatus to the specific application to meet target emission standards.

13. In reference to claims 9 and 15, Strehlau discloses the apparatus of claim 4, further including a honeycomb substrate made of cordierite or metal, a porous support, and a sulfur trapping agent supported on the porous support (col. 11, lines 17-57). With regards to the limitation of the amount of alkali metals or alkaline earth metals, Strehlau teaches the storage components are selected depending on the temperature and storage capacity required (col. 10, lines 9-22). It would have been obvious to one

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having ordinary skill in the art at the time of invention to have selected the optimum amount of the selected storage component through routine experimentation to have the predictable result of adapting the apparatus to the specific application.

14. In reference to claim 14, Strehlau further discloses the sulfur component trapping agent further comprises at least one element selected from the group consisting of Ce, Al, Y, La and Ni (col. 10, lines 9-22).

15. In reference to claim 16, under the principles of inherency, the apparatus of the modified Strehlau would necessarily perform the method claimed in its normal and usual operation and therefore meets the limitations of the claim.

16. In reference to claim 18, Strehlau further discloses a step for releasing the sulfur components from the NO_x purifying catalyst, wherein the releasing step is carried out by changing the air fuel ratio to rich or stoichiometric and elevating temperature of the NO_x purifying catalyst to 500 °C or higher (col. 8, line 56 – col. 9, line 60).

17. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strehlau as applied to claim 1 above, and further in view of US PG PUB No.

2005/0145827 to McCabe et al. (McCabe).

18. In reference to claims 7 and 8, Strehlau discloses the apparatus of claim 1, but fails to specifically disclose a filter. McCabe discloses a similar system including a filter disposed upstream of the NO_x trapping catalyst, wherein the filter is provided with a catalyst for oxidizing the sulfur components and the filter is provided with the sulfur component trapping agent (pars. 0012, 0014, 0030, etc.). It would have been obvious to one having ordinary skill in the art at the time of invention to have incorporated a filter

as taught by McCabe into the apparatus of Strehlau to have the predictable result of removing particulates from the exhaust. Furthermore, it would have been obvious to one having ordinary skill in the art at the time of invention to have incorporated both the oxidizing catalyst and sulfur component trapping agent on said filter, as taught by McCabe, to have the benefit of reducing the number of treatment elements required, predictably resulting in reduced cost.

19. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Strehlau as applied to claim 1 above, and further in view of US PG PUB No. 2003/0049191 to Twigg (Twigg).

20. In reference to claim 12, Strehlau discloses the apparatus of claim 1, but fails to specifically disclose the sulfur component trapping agent is replaceable with another. Twigg discloses a similar system and is brought in merely to demonstrate that it is conventional in the art to utilize replaceable sulfur trapping agents in exhaust treatment apparatuses (Fig. 1; Abstract, par. 0008, etc.). It would have been obvious to one having ordinary skill in the art at the time of invention to have incorporated a replaceable trapping agent, as suggested by Twigg, into the apparatus of Strehlau to have the predictable result of maintaining the treatment capabilities of the system over the lifetime of the system.

21. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strehlau in view of US PG PUB No. 2003/0010020 to Taga et al. (Taga) and US Patent No. 6,263,666 to Kubo et al. (Kubo).

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22. In reference to claims 19 and 20, Strehlau discloses a NO_x purification catalyst (6, Fig. 21) for trapping NO_x, a sulfur component trapping agent disposed before the NO_x purification catalyst for trapping sulfur components (5, Fig. 21), the sulfur trapping agent containing at least one alkali or alkaline earth metal (col. 10, lines 9-22) and at least one noble metal in an amount of 0.4 % by weight or less of the sulfur trapping agent (col. 10, line 59 – col. 11, line 16), and a sulfur component oxidizing catalyst (8, Fig. 21) disposed before the sulfur component trapping agent. Strehlau fails to specifically disclose measuring NO_x purification rates, diagnosing the degradation of the sulfur component trapping agent, and a replacement indication means. Taga discloses a similar system which comprises means for diagnosing the sulfur component trapping agent for every sulfur component releasing step based on a difference or ratio of the NO_x purification rates (pars. 0035-0084). It would have been obvious to one having ordinary skill in the art at the time of invention to have incorporated the diagnosis method as taught by Taga into the method of Strehlau to have the predictable result of inhibiting unnecessary sulfur purges, as taught by Taga. Kubo discloses a similar system and is brought in merely to demonstrate it is conventional in the art to include an indicating means to indicate when an aftertreatment device is degraded (col. 8, lines 62-67). It would have been obvious to one having ordinary skill in the art at the time of invention to have included the conventional warning means as suggested by Kubo into the modified Strehlau to have the predictable result of maintaining the treatment capabilities of the system over the lifetime of the system.

Response to Arguments

23. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

25. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Matthias whose telephone number is (571) 270-5840. The examiner can normally be reached on Monday-Friday 8:00AM-5:00PM.

27. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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28. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas E. Denion/
Supervisory Patent Examiner, Art Unit 3748

JM